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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,987	04/06/2007	Khalil Arar	120361	9438

27148 7590 10/25/2010

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EXAMINER
CALAMITA, HEATHER

ART UNIT	PAPER NUMBER
1637	

MAIL DATE	DELIVERY MODE
10/25/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,987	ARAR, KHALIL	
	Examiner	Art Unit	
	HEATHER CALAMITA	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *1-10,12,16,20,21,25,28,32 and 34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11, 13-15, 17-19, 22-24, 26, 27, 29-31, 33 and 35-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application, Amendments, and/or Claims

1. Claims 1-38 are currently pending. Claims 1-10, 12, 16, 20, 21, 25, 28, 32 and 34 are withdrawn as being directed to non-elected subject matter. Claims 11, 13-15, 17-19, 22-24, 26, 27, 29-31, 33 and 35-38 are under examination. All arguments have been fully considered and thoroughly reviewed, but are deemed not persuasive for the reasons that follow. Any objections and rejections not reiterated below are hereby withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 13-15, 17-19, 22-24, 26, 27, 29-31, 33 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed et al. (USPN 6,727,356) in view of Nikiforov et al. (USPN 6,777,184).

The only difference between instant claims 11 and 24 is that claim 24 requires a pair of probes for detection rather than a single probe therefore the claims will be addressed together in the rejection with reference to the requirement of a probe pair.

With regard to claims 11 and 24, Reed et al. teach a method for detection or quantification of a nucleic acid analyte comprising the steps of

a) providing a pair of nucleic acid probes, wherein said probes differ in their nucleic acid sequences and are collectively derivatized with two or more non-identical covalently attached dyes, wherein at least one dye is fluorescent and wherein each probe comprises at least one of the dyes (see col. 5 lines 16-32)

b) contacting the pair of nucleic acid probes with the nucleic acid analyte so as to allow for the hybridization of the pair of nucleic acid probes with the nucleic acid analyte in such a way that both probes are hybridized to adjacent segments of the target sequence of the nucleic acid analyte (see col. 5 lines 16-32, where SNP analysis using TaqMan is referenced)

c) measuring the change in the fluorescence of the pair of nucleic acid probes that is related to the hybridization of the nucleic acid probe with the nucleic acid analyte (see col. 5 lines 16-32, where SNP analysis using TaqMan is referenced)

With regard to claims 13 and 26, Reed et al. teach the pair of nucleic acid probes comprises a donor dye and an acceptor dye which are able to jointly constitute a FRET system (see col. 6 lines 6-17)

With regard to claims 14 and 30, Reed et al. teach the method is carried out as a homogeneous assay to detect or quantify a nucleic acid in a sample (see col. 5 lines 16-32, where SNP analysis using TaqMan is referenced, this is a homogeneous assay)

With regard to claims 15 and 31, Reed et al. teach the change in the fluorescence occurs upon the hybridization of the nucleic acid probe with the nucleic acid analyte (see col. 5 lines 16-32, where SNP analysis using TaqMan is referenced and col. 6 lines 6-17, where FRET is referenced)

With regard to claims 17 and 33, Reed et al. teach the homogeneous assay is PCR (see col. 6 lines 6-17 and col. 5 lines 16-32, where SNP analysis using TaqMan is referenced--TaqMan is a PCR assay)

With regard to claims 18 and 35, Reed et al. teach the probe functions as a hybridization probe in a PCR providing for a real-time detection or quantification of the amplification product (see col. 6 lines 6-17 and col. 5 lines 16-32, where SNP analysis using TaqMan is referenced)

With regard to claim 19, Reed et al. teach the nucleic acid probe is adapted for use as a molecular beacon (see col. 6 lines 6-17 and col. 5 lines 16-32)

With regard to claims 21and 36, Reed et al. teach the probe is adapted for use as a TaqMan probe in the LightCycler (see col. 5 lines 16-32, where SNP analysis using TaqMan is referenced)

With regard to claim 22, Reed et al. teach, the method is multiplexed (see col. 6 lines 6-17 and col. 5 lines 16-32, where SNP analysis using TaqMan is referenced)

With regard to claims 27 and 37, Reed et al. teach the donor and acceptor dyes are within 25 nucleotides of one another (see col. 39 lines 61-67)

With regard to claim 38, Reed et al. teach analyzing a SNP site of a nucleic acid with a pair of (see col. 5 lines 16-32, where SNP analysis using TaqMan is referenced).

Reed et al. do not specifically teach the donor acceptor pair recited in claim 29.

Reed et al. do not teach the probes include at least on monomeric LNA moiety.

Reed et al. do teach donor/acceptor pairs and Reed teaches at col. 38 line that selection of appropriate fluorescent donor/acceptor pairs will be apparent to one of skill in the art. Therefore it would be obvious to substitute the pair disclosed by Reed with the pair recited in claim 29, because Reed states that it is apparent to one of skill in the art as to how to select a fluorescent donor/acceptor pair.

Nikiforov et al. teach nucleic acid probes derivatized with fluorescent dyes which also comprise monomeric LNA moieties and the LNA moiety is complementary to the opposing SNP site subsequent to the hybridization of the probes with the target analyte (see col. 7 lines 40-41, where a probe is disclosed which contains a rhodamine label and a LNA moiety and col. 13 lines 50-67, where SNP detection is disclosed).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use the LNA moiety, as taught by Nikiforov et al. with the probes as taught by Reed et al. since Nikiforov et al. teaches that LNAs obey Watson-Crick base pairing rules and hybridize to complementary DNA, RNA or PNA and that LNAs can bind to DNAs or other nucleic acids with higher avidity, affinity and/or specificity than corresponding standard DNAs (see col. 7 lines 14-15 and col. 7 lines 4-6). Additionally, Nikiforov et al. teach probes containing LNA moieties and a derivatized fluorescent label for use in the detection of SNPs. An ordinary practitioner would have been motivated

to use LNA moiety, as taught by Nikiforov et al. with the probes as taught by Reed et al. in order to have probes with higher avidity, affinity and/or specificity than corresponding standard DNAs for the detection of SNPs in nucleic acid analytes. A skilled artisan recognizes the advantages of having probes with greater avidity, affinity and specificity for the detection of nucleic acid analytes. Such probes will reduce incidence of false positives, negatives and artifacts in the data.

Response to Arguments

3. Applicant's arguments, see reply, filed August 16, 2010, have been fully considered but they are not persuasive.

Applicant argues beginning on page 9 of the response that Nikiforov et al. is not enabled with respect to probes comprising LNAs because Nikiforov does not provide working examples of probes comprising LNAs but rather LNAs are listed as possible entities for probes. Applicants argue the reference provides no guidance with respect to the number and position of LNAs in the probe or the length of the probe containing the LNA. These arguments are not persuasive because all US patents have a presumption of validity meaning they are enabled. Additionally, Nikiforov does not have to provide a working example, only a teaching as to why a skilled artisan would use LNAs and Nikiforov does this as stated in the rejection above. Moreover, Nikiforov teaches that LNAs obey Watson-Crick base pairing rules and hybridize to complementary DNA, RNA or PNA and that LNAs can bind to DNAs or other nucleic acids with higher avidity, affinity and/or specificity than corresponding standard DNAs (see col. 7 lines 14-15 and col. 7 lines 4-6). Based on this information a skilled artisan would be able to discern specifics such as number and position of LNAs in the probe or the length of the probe containing the LNA with a reasonable expectation of success. The rejections are therefore maintained. Applicant's arguments with respect to claims 13-15, 17-19, 22-23, 26, 27, 29-31, 33 and 35-38 are moot in view of the further explanation of the application of Reed in view of Nikiforov.

Summary

4. No claims were allowable.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather G. Calamita whose telephone number is 571.272.2876 and whose e-mail address is heather.calamita@uspto.gov. However, the office cannot guarantee security through the e-mail system nor should official papers be transmitted through this route. The examiner can normally be reached on Monday through Thursday, 7:00 AM to 5:30 PM.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Gary Benzion can be reached at 571.272.0782.

Papers related to this application may be faxed to Group 1637 via the PTO Fax Center using the fax number 571.273.8300.
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to 571.272.0547.

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applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public. For more information about the PAIR system, see http://pair-direct.uspto.gov.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

/Heather G. Calamita/
Primary Examiner, Art Unit 1637